

What is claimed is:

1. (Currently Amended) A method comprising optimizing a data path and forwarding data from a start node to an end node over a hierarchical network,  
wherein the hierarchical network comprises first nodes, on a first layer of the hierarchical network, each first node being capable to perform one of more first node functions,  
wherein one or more of said first node functions are to be applied on said data while forwarding said data through the hierarchical network,  
wherein a number of data path options through the first nodes are determined, for each data path option, the first nodes, having one or more assigned first node functions,  
wherein a first capacity value for each of said first nodes and for each of said first node functions and/or combinations of said first node functions are provided; and  
wherein the data is forwarded through the data path which is determined by the data path option having a minimum overall capacity regarding the first capacity values;  
characterized in that said one or more of said first nodes comprises a logical node comprising a hierarchical sub-network having one or more second physical nodes on [[a]] distinguishable second lower layers of the hierarchical sub-network, ~~thereby- the second~~ physical nodes unknown to the ~~first nodes~~ start node on the first layer, each of the second physical nodes assigned to one of the first logical nodes is capable to perform one or more second node functions,  
wherein said first node functions of the first nodes are provided by said second node functions,

wherein providing one of said first capacity values for one specific first node and for one specific first node function and/or one specific combination of said first node functions, including the following steps:

[[ -]] determining a number of second data path options for the second physical nodes of the one specific first node to perform said one specific first node function, for each second data path option, the second physical nodes having one or more assigned second node functions,

[[ -]] providing second capacity values for each of said second physical nodes and for each of said assigned second node functions;

[[ -]] determining the overall capacity values of said second data path options with regard to the second capacity values;

[[ -]] determining the minimum overall capacity value of any of said second data path options; and

[[ -]] providing the minimum overall capacity value as the first capacity value.

2. (Cancelled)
3. (Original) A method according to claim 1, wherein the second nodes are physical nodes wherein the second capacity values depending on a data processing speed, a data handling speed an/or a buffering capacity related to the assigned second node functions.
4. (Currently Amended) A router device for determining a data path from a start node to an end node over a hierarchical network,

wherein the hierarchical network comprises first nodes on a first layer of the hierarchical network, each capable to perform one or more first node functions,

wherein one or more of said first node functions are to be applied on said data while forwarding said data through the hierarchical network, said one or more of said first nodes ~~comprise~~ comprising a logical node including a hierarchical sub-network having one or more second physical nodes on a ~~distinguishable second layer~~ lower layers of the hierarchical network, ~~thereby the second physical nodes~~ unknown to the first nodes ~~start node on the first layer~~, each of the second physical nodes assigned to one of the first logical nodes is capable to perform one or more second node functions,

wherein said first node functions of the first logical nodes are provided by said one or more second node functions, the router comprising:

[[ - ]] a first data path determining means to determine a number of data path options through the first logical nodes for each data path option, the first logical nodes having one or more assigned first node functions,

[[ - ]] a first means for determining the minimum overall capacity value of any of said first data path options regarding first capacity values for each of said first logical nodes and for each of said first node functions and/or combinations of said first node functions;

[[ - ]] receiving means for receiving said first capacity values for each of said first logical nodes and for each of said first node functions and/or combinations of said first node functions.

5. (Currently Amended) A router device according to claim 4 further comprising a request transmitting means for sending a request for first capacity values for each of said first logical nodes and for each of said first node functions and/or combinations of said first node functions to each of said first logical nodes.

6. (Currently Amended) A network node amongst a plurality of network nodes of a hierarchical communications network, said network node comprising:

[[ - ]] a hierarchical sub-network having one or more physical sub-nodes on a lower layer of the hierarchical network, the physical subnodes being unknown to a start node on a first layer of said hierarchical communications network, at least one subnode unknown to the plurality of network nodes, each physical subnode being able to execute at least one function, wherein a subnode capacity value is assigned to each subnode and to each function related to the respective physical subnode,

[[ - ]] a request receiving means to receive a request for providing overall capacity values related to a set of at least one specific function able to be executed by the network node,

[[ - ]] a data path determining means to determine a number of data path options for each of the functions of the set of at least one specific function to be executed by the network node,

[[ - ]] capacity determining means to determine an overall capacity value for each of the data path options and for each of the functions of said set of at least one specific function to be performed in the network node, wherein said overall capacity values of each data path option are determined with regard to said subnode capacity values

provided for each of said physical subnodes and for each of said assigned specific functions;

and

[[ -]] transmitting means for transmitting a minimum overall capacity value for each of the specific functions of the set of one or more specific functions and for the assigned data path option as the requested overall capacity value.

7. (Original) An article of manufacture comprising a computer usable medium having computer readable program code means embodied therein for causing data path optimization and data forwarding, the computer readable program code means in said article of manufacture comprising computer readable program code means for causing a computer to effect the steps of claim 1.
8. (Original) A program storage device readable by machine, tangibly embodying a program of instructions executable by the machine to perform method steps for optimizing a data path and forwarding data, said method steps comprising the steps of claim 1.
9. – 10. (Cancelled)
11. (Original) An article of manufacture comprising a computer usable medium having computer readable program code means embodied therein for causing data path optimization and data forwarding the computer readable program code means in said

article of manufacture comprising computer readable program code means for causing a computer to effect the steps of claim 3.

12. (Original) A program storage device readable by machine, tangibly embodying a program of instructions executable by the machine to perform method steps for optimizing a data path and forwarding data, said method steps comprising the steps of claim 3.

13. (Cancelled)

14. (Currently Amended) An apparatus comprising means for optimizing a data path and means for forwarding data from a start node to an end node over a hierarchical network, wherein the hierarchical network comprises first nodes on a first layer of the hierarchical network, each first node being capable to perform one or more first node functions,

wherein one or more of said first node functions are to be applied on said data while forwarding said data through the hierarchical network,

wherein a number of data path options through the first nodes are determined, for each data path option, the first nodes, having one or more assigned first node functions,

wherein a first capacity value for each of said first nodes and for each of said first node functions and/or combinations of said first node functions are provided; and

wherein the data is forwarded through the data path which is determined by the data path option having a minimum overall capacity regarding the first capacity values; characterized in that said one or more of said first nodes comprises a logical node comprising a hierarchical sub-network having one or more second physical nodes on a

distinguishable second layer lower layers of the hierarchical network, thereby ~~the second~~ physical nodes unknown to the start node ~~first nodes on the first layer~~, each of the second physical nodes assigned to one of the first logical nodes is capable to perform one or more second node functions, wherein said first node functions of the first nodes are provided by said second node functions,

wherein providing one of said first capacity values for one specific first node and for one specific first node function and/or one specific combination of said first node functions, comprising:

[[ - ]] means for determining a number of second data path options for the second nodes of the one specific first node to perform said one specific first node function, for each second data path option, the second nodes having one or more assigned second node functions,

[[ - ]] means for providing second capacity values for each of said second nodes and for each of said assigned second node functions;

[[ - ]] means for determining the overall capacity values of said second data path options with regard to the second capacity values;

[[ - ]] means for determining the minimum overall capacity value of any of said second data path options; and

[[ - ]] means for providing the minimum overall capacity value as the first capacity value.

15. (Cancelled)